CLAIMS

1. An article with a composite hard coat layer, the composite hard coat layer comprising a hard coat layer on a surface of the article and an anti-staining surface layer on a surface of the hard coat layer, wherein

the hard coat layer is made of a cured product of a hard coat agent composition comprising a silicon compound and/or a condensation compound thereof,

the anti-staining surface layer is made of a cured product of an anti-staining and/or lubricating functional material that comprises a silicon compound, and

the anti-staining surface layer is fixed on the hard coat layer.

2. The article with the composite hard coat layer according to claim 1, wherein the anti-staining surface layer has a thickness of 1 nm or more and 100 nm or less.

3. The article with the composite hard coat layer according to claim 1, wherein

the hard coat layer is made of a cured product of a hard coat agent composition comprising a hydrolysis-polymerizable silicon compound and/or a condensation compound thereof,

the anti-staining surface layer is made of a cured product of an anti-staining and/or lubricating functional material that comprises a silane coupling agent, and

the anti-staining surface layer is fixed on the hard coat layer.

4. The article with the composite hard coat layer according to claim 1, wherein

the hard coat layer is made of a cured product of a hard coat agent composition comprising a hydrolysis-polymerizable silicon compound and/or a condensation compound thereof,

the anti-staining surface layer is made of a cured product of an anti-staining and/or lubricating functional material that comprises a silazane compound, and

the anti-staining surface layer is fixed on the hard coat layer.

5. The article with the composite hard coat layer according to claim 1, wherein

the hard coat layer is made of a cured product of a hard coat agent composition comprising a silazane compound,

the anti-staining surface layer is made of a cured product of an anti-staining and/or lubricating functional material that comprises a silane coupling agent, and

the anti-staining surface layer is fixed on the hard coat layer.

6. The article with the composite hard coat layer according to claim 1, wherein

the hard coat layer is made of a cured product of a hard coat agent composition comprising a silazane compound,

the anti-staining surface layer is made of a cured product of an anti-staining and/or lubricating functional material that comprises a silazane compound, and

the anti-staining surface layer is fixed on the hard coat layer.

7. The article with the composite hard coat layer according to claim 3 or 4, wherein the hydrolysis-polymerizable silicon compound comprised in the hard coat agent composition is selected from silicon compounds represented by the following general formula (I):

$$Si(X)_{4-n}(R)_n \qquad (I)$$

where X is a hydrolyzable group; R is an organic group; and n is an integer of 0 to 3.

8. The article with the composite hard coat layer according to claim 3 or 5, wherein the silane coupling agent comprised in the anti-staining and/or lubricating functional material includes a silicone-based and/or a fluorine-based substituent.

9. The article with the composite hard coat layer according to claim 4 or 6, wherein the silazane compound comprised in the anti-staining and/or lubricating functional material includes a silicone-based and/or a fluorine-based substituent.

10. The article with the composite hard coat layer according to claim 1, wherein the hard coat agent composition

further comprises a polymerization curing organic compound that polymerizes and cures upon irradiation with active energy rays and/or upon application of heat.

11. A method for forming a composite hard coat layer comprising a hard coat layer and an anti-staining surface layer on a surface of an article, the method comprising the steps of:

applying a hard coat agent composition comprising a silicon compound and/or a condensation compound thereof onto a surface of an article to be hard-coat-treated, thereby forming a hard coat agent composition layer;

film-forming, on a surface of the hard coat agent composition layer, with an anti-staining and/or lubricating functional material that comprises a silicon compound, thereby forming a surface material layer; and

heating the formed hard coat agent composition layer and surface material layer so as to cure the both layers simultaneously, thereby forming a hard coat layer contacting the surface of the article and an anti-staining surface layer contacting the surface of the hard coat layer.

12. The method for forming the composite hard coat layer according to claim 11, wherein the anti-staining surface layer is formed to have a thickness of 1 nm or more and 100 nm or less.

13. The method for forming the composite hard coat layer

according to claim 11, wherein the hard coat agent composition is a hard coat agent composition which comprises a hydrolysis-polymerizable silicon compound and/or a condensation compound thereof, or a hard coat agent composition which comprises a silazane compound.

14. The method for forming the composite hard coat layer according to claim 11, wherein the anti-staining and/or lubricating functional material is a material which comprises a silane coupling agent having a silicone-based and/or a fluorine-based substituent, or a material which comprises a silazane compound having a silicone-based and/or a fluorine-based substituent.

15. The method for forming the composite hard coat layer according to claim 11, wherein the hard coat agent composition further comprises a polymerization curing organic compound that polymerizes and cures upon irradiation with active energy rays and/or upon application of heat.

16. The method for forming the composite hard coat layer according to claim 11, wherein after the hard coat agent composition is applied onto the surface of the article,

the hard coat agent composition layer is dried to remove a solvent contained in the hard coat agent composition from the hard coat agent composition layer, and then

the surface material layer is formed.

17. The method for forming the composite hard coat layer

according to claim 11, wherein after the hard coat agent composition is applied onto the surface of the article,

the hard coat agent composition layer is dried if necessary, and is then heated, and/or irradiated with active energy rays if the hard coat agent composition comprises the polymerization curing organic compound that polymerizes and cures when irradiated with active energy rays, to turn the hard coat agent composition layer into a half-cured state, and then

the surface material layer is formed.

18. The method for forming the composite hard coat layer according to claim 11, wherein the surface material layer is formed by film-forming with the anti-staining and/or lubricating functional material by applying or depositing.

19. The method for forming the composite hard coat layer according to claim 15, wherein when the hard coat agent composition comprises the polymerization curing organic compound that polymerizes and cures upon irradiation with active energy rays, either the active energy rays are irradiated after the formed hard coat agent composition layer and surface material layer have been heated, or the active energy rays are irradiated before the formed hard coat agent composition layer and surface material layer are heated.

20. The method for forming the composite hard coat layer according to claim 17 or 19, wherein the active energy rays are electron rays or ultraviolet rays.

21. An article with a composite hard coat layer, the composite hard coat layer comprising a hard coat layer on a surface of the article and an anti-staining surface layer on a surface of the hard coat layer, wherein the article is obtained by

applying a hard coat agent composition comprising a silicon compound and/or a condensation compound thereof onto a surface of an article to be hard-coat-treated, thereby forming a hard coat agent composition layer,

film-forming, on a surface of the hard coat agent composition layer, with an anti-staining and/or lubricating functional material that comprises a silicon compound, thereby forming a surface material layer, and

heating the formed hard coat agent composition layer and surface material layer, so as to cure the both layers simultaneously, thereby forming a hard coat layer contacting the surface of the article and an anti-staining surface layer contacting the surface of the hard coat layer.

22. The article with the composite hard coat layer according to claim 1 or 21, wherein the article is an optical recording medium, a magneto-optical recording medium, an optical lens, an optical filter, an anti-reflection film, or any one of various display elements.